On-Board Diagnostics (OBD)

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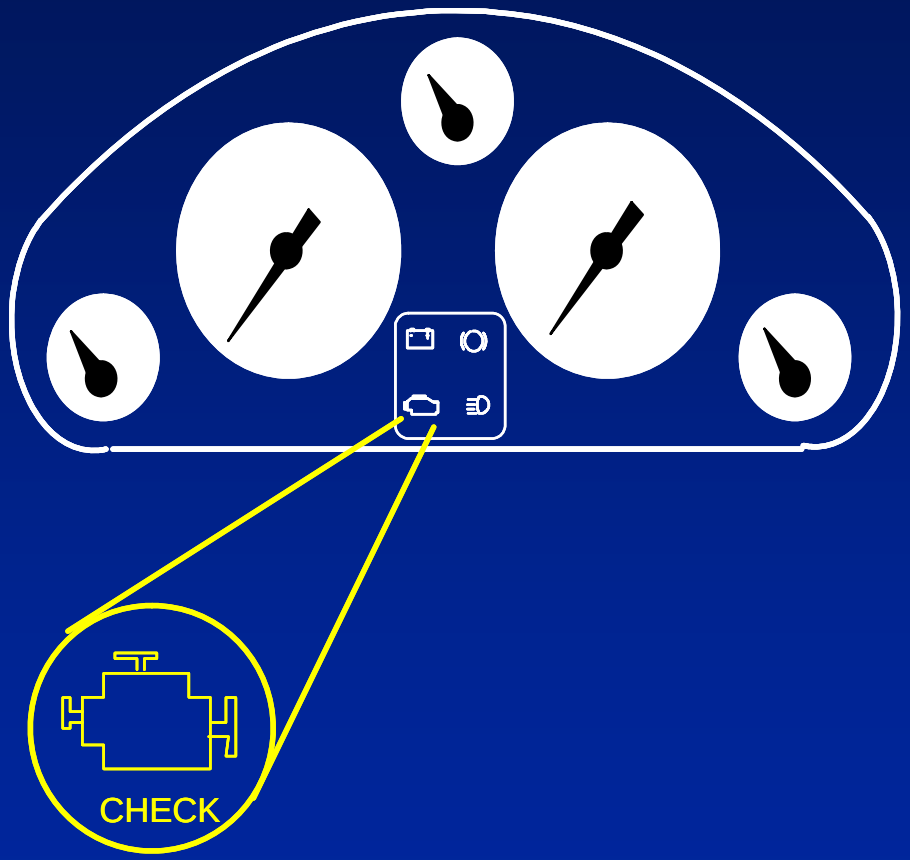
UC Merced

On-Board Diagnostics
What is OBD?

- Monitor the performance of virtually all emission-related components on the vehicle
- Mostly software in the computer that runs diagnostic routines in the background whenever the vehicle is being used

Malfunction Indicator Light (MIL)

Should a malfunction be detected, an indicator light will appear on the vehicle's instrument panel



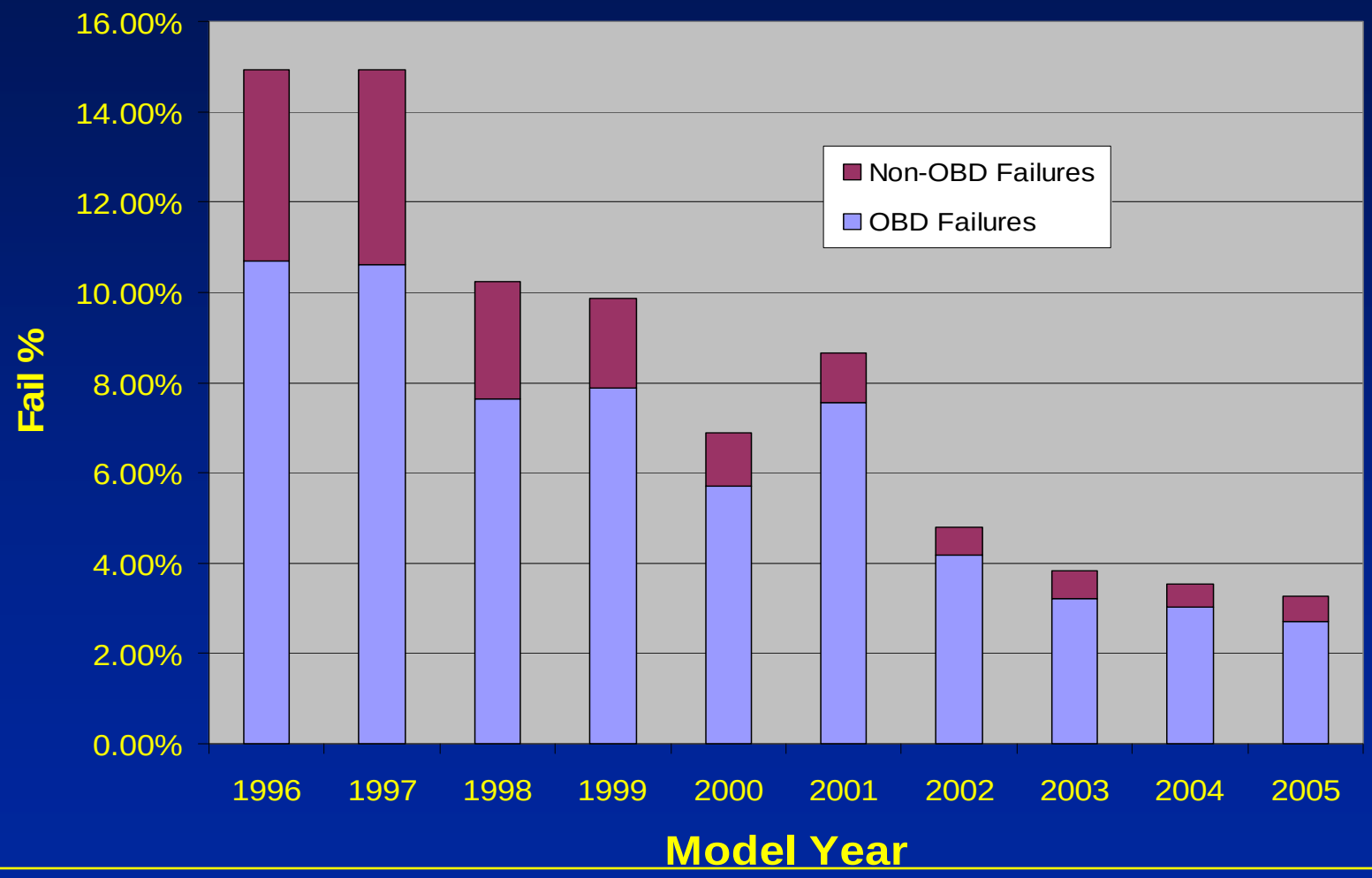
Scan Tool

- When a malfunction is detected, information is stored in the computer that details what component is malfunctioning
- Mechanics can download information with a "scan tool" to assist in repair of the vehicle

Implementation status

- OBDII systems on all light-, medium-duty vehicles since 1996 model year
  - Over 140 million cars nationwide
- Impact on vehicle durability, warranty, emission levels for the life of the vehicle
- Used in SmogCheck and other Inspection/Maintenance programs in 32 states
  - Primary mechanism used to identify needed emission repairs

SmogCheck Failure Rates



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Where could we go with SmogCheck?

- "OBD-only" inspections
  - Simplify, quicken, and reduce cost of inspections
  - Used by 31 other states today
- Repairing broken cars is where the emission benefit is
  - Need to minimize time spent inspecting clean cars

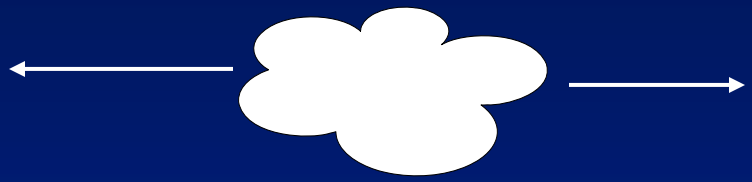
Some states pursuing "Self-serve" OBD Inspections

- Use 'ATM-like' kiosks
- Open 24/7
- Maximize time spent fixing broken cars, minimize time spent inspecting clean cars

"Remote" OBD (OBD III)

- Concept being pursued by various states
  - Gather the same data that SmogCheck gathers today
  - Communicate the data automatically
  - Require vehicle owners to repair in a given timeframe
- Benefits:
  - Virtually eliminate inspections
  - Only send a vehicle to a shop when it needs a repair
  - Near continuous inspections instead of biennial
- Devices currently on the market

NetworkCar System



Vehicle owner notified via e-mail of vehicle problem.

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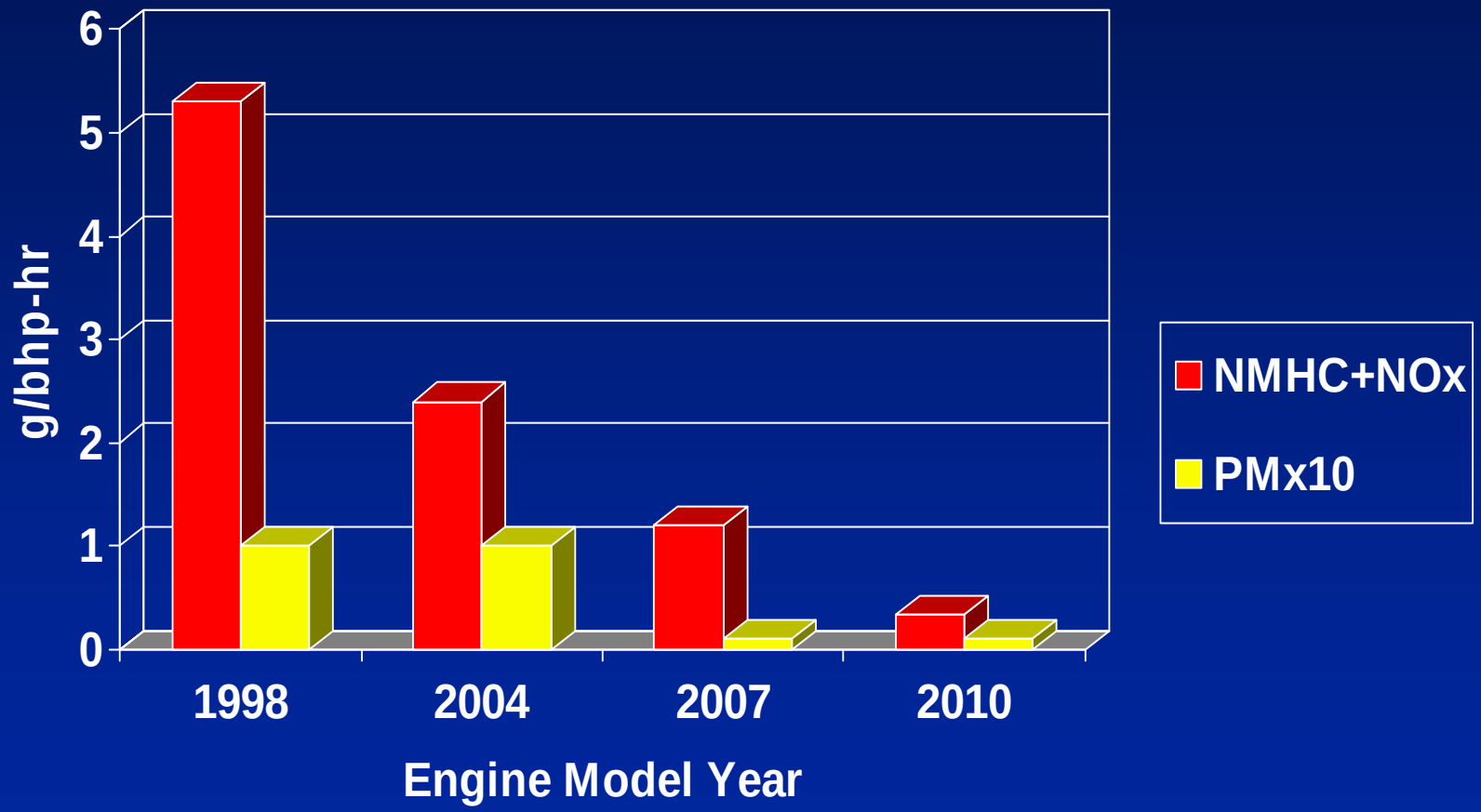
Heavy-Duty OBD

- HD vehicles (>14,000 GVWR)
  - Significant source of diesel PM, NOx emissions
- OBD starting in 2010 model year for HD on-road vehicles
  - Phase in 2010, all products by 2013

On-road HD Diesel Emission Standards Becoming More Stringent



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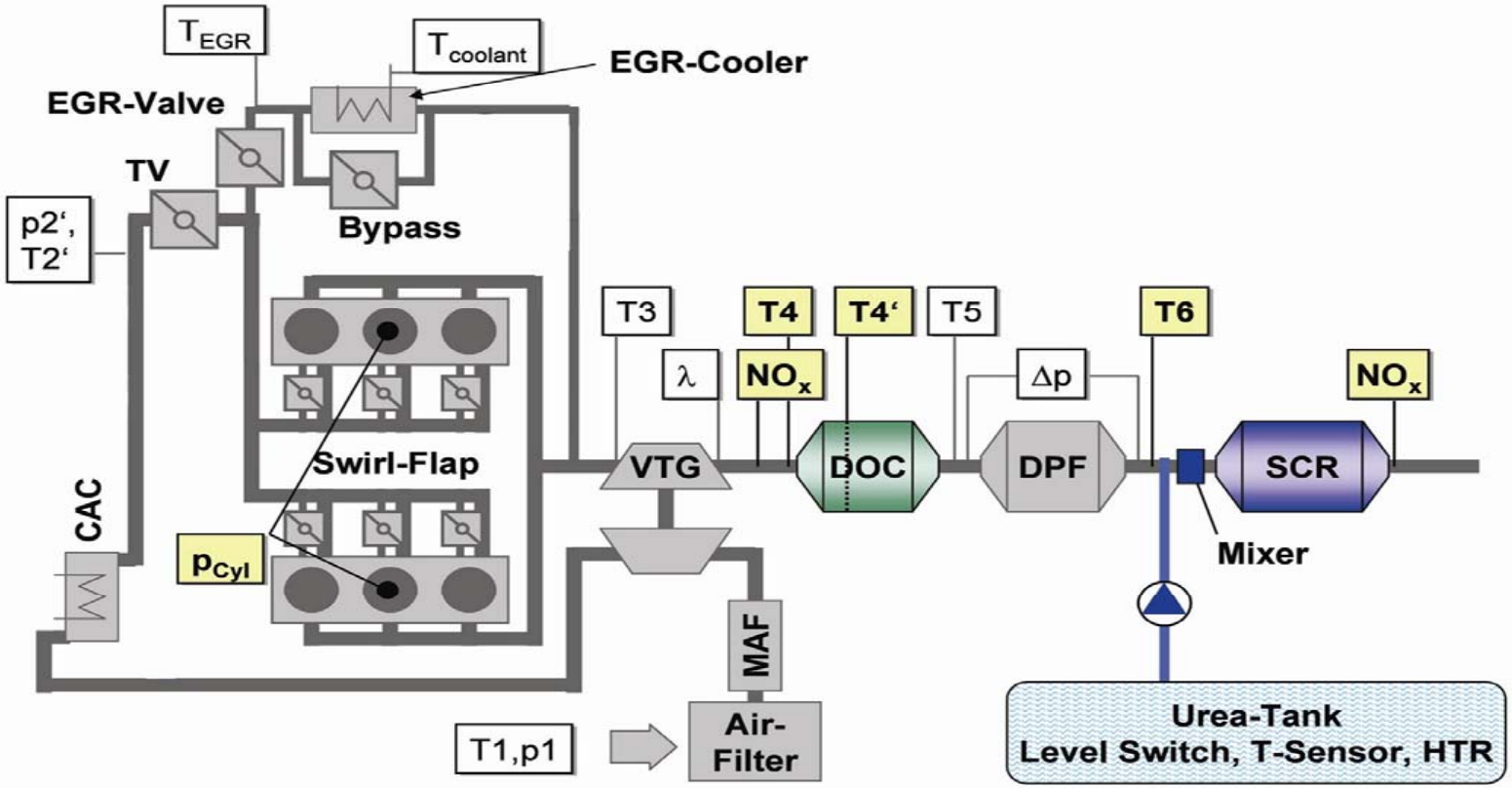
And Emission Controls increasingly complex…



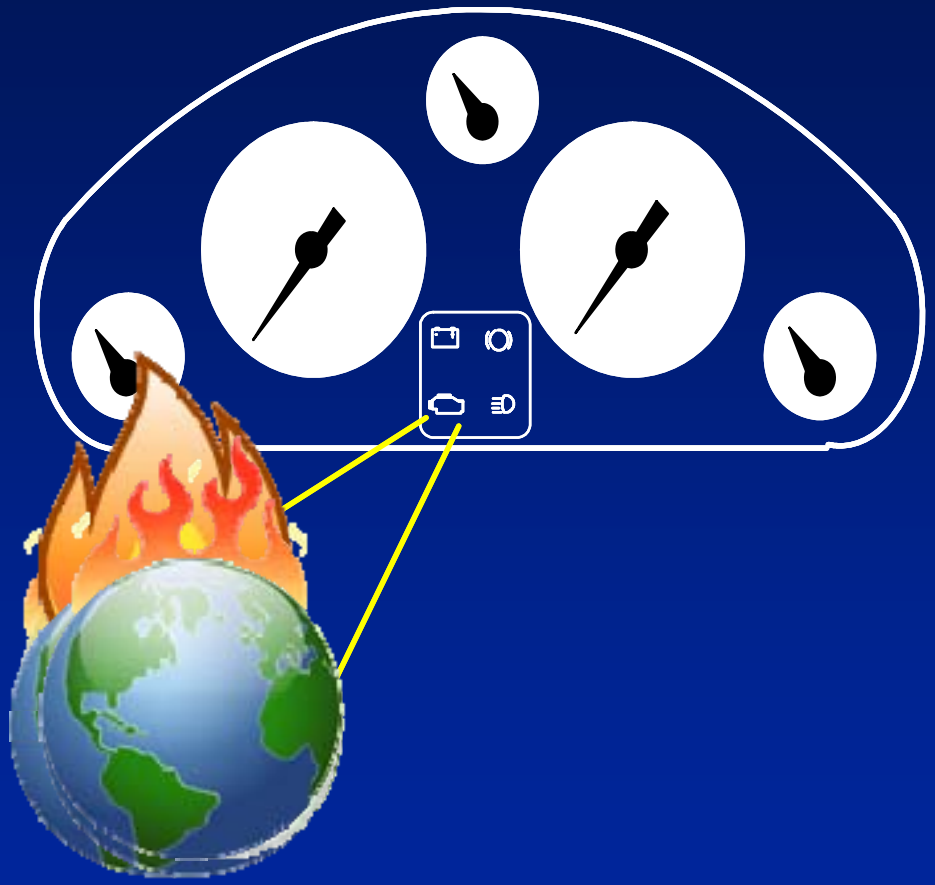
Possible roles for Heavy-Duty OBD

- Current inspections cover <100% of trucks
  - Opacity (~ PM) test
- OBD offers comprehensive inspection
  - Covers PM, NOx, HC, and CO
  - Quicker inspection
- Might be optimal population for:
  - Nationwide program
  - More automated program
  - Remote OBD
    - Integrate with other systems such as weigh station bypass?

OBD and Greenhouse Gases (GHGs)

- OBD focused to date on criteria pollutants
  - But, repairs generally improve CO2 emission levels
- Could be an area of expansion for OBD

Might warrant a different warning light…



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